

# Robotics 3 - Unit 5

Content Area: **21st Century Life & Careers**  
Course(s): **Engineering Robotics 3**  
Time Period: **Generic Time Period**  
Length: **7 weeks**  
Status: **Published**

## Unit Introduction

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This advanced unit will have students prepare for, design, fabricate, test, and compete in the First Robotics Competition. Students will evaluate last year's competition robot for strengths and weaknesses within the design and utilization within competition. Once the competition is released, students will analyze the rules and regulations for any changes from previous years and then begin designing a competition robot. Students will also begin fabrication on the field implements to test their design against. Everything will be designed in 3D and tested within a virtual arena.

## Standards

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9.3.12.AC.6	Read, interpret and use technical drawings, documents and specifications to plan a project.
9.3.12.AC-CST.5	Apply practices and procedures required to maintain jobsite safety.
9.3.12.AC-DES.1	Justify design solutions through the use of research documentation and analysis of data.
12.9.3.ST.1	Apply engineering skills in a project that requires project management, process control and quality assurance.
12.9.3.ST-ET.4	Apply the elements of the design process.
TECH.8.1.12.A.3	Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.2.12.C.4	Explain and identify interdependent systems and their functions.
TECH.8.2.12.C.5	Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.
TECH.8.2.12.D.3	Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.
TECH.8.2.12.D.CS1	Apply the design process.
TECH.8.2.12.D.CS2	Use and maintain technological products and systems.
TECH.8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).
TECH.8.2.12.E.CS1	Computational thinking and computer programming as tools used in design and engineering.

## Essential Questions

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How to analyze and evaluate a design?

What is the relationship between design and use?

How to incorporate an Arduino Uno into an FRC robot design?

How to identify necessary details?

How to properly compromise on design?

## **Content / Skills**

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Time Management

Research and Identification

Incorporating Arduino and Sensors

Coding

Automation

Signal Based Communication

Driving

3D Design

3D Testing and Evaluation

Fabrication

Team Communication